

## AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

### LISTING OF CLAIMS

1. (Original) A regenerative pumping mechanism comprising a rotor having a series of blades positioned in an annular array on one side of the rotor and extending axially into an annular channel of a stator within which the blades rotate, and means for actively controlling relative axial movement between the rotor and the stator so as to control the axial clearance between the rotor and the stator.
2. (Currently Amended) A~~The~~ mechanism according to G~~c~~laim 1, wherein the means for actively controlling relative axial movement comprises an axial magnetic bearing for controlling axial movement of the rotor relative to the stator.
3. (Currently Amended) A~~The~~ mechanism according to G~~c~~laim 2, wherein the axial magnetic bearing comprises at least one electromagnet arranged to draw the rotor towards the stator.
4. (Currently Amended) A~~The~~ mechanism according to G~~c~~laim 3, wherein the electromagnet is mounted on the stator.
5. (Currently Amended) A~~The~~ mechanism according to G~~c~~laim 3 ~~or Claim 4~~, wherein the axial magnetic bearing comprises ~~at least one a~~ second electromagnet arranged to draw the rotor away from the stator.
6. (Currently Amended) A~~The~~ mechanism according to G~~c~~laim 5, wherein the axial magnetic bearing comprises a magnetic bearing rotor, and the magnetic bearing rotor and the rotor of the regenerative mechanism ~~being located~~ are positioned on a common shaft, and wherein the magnetic bearing rotor ~~being located~~ is positioned between the first and second electromagnets.

7. (Currently Amended) ~~A~~The mechanism according to ~~any of C~~claim 3 ~~to 6~~, comprising control means for controlling the strength of the magnetic field generated by the electromagnet ~~(s)~~ and ~~thus the axial position of the rotor relative to the stator.~~
8. (Currently Amended) ~~A~~The mechanism according to ~~C~~claim 1, wherein the means for actively controlling axial movement comprises an actuator actuatable to control the axial position of the rotor.
9. (Currently Amended) ~~A~~The mechanism according to ~~C~~claim 8, wherein the actuator comprises a magnetostrictive material.
10. (Currently Amended) ~~A~~The mechanism according to ~~C~~claim 9, comprising control means for controlling the strength of a magnetic field applied to the actuator ~~so as to control the shape of the actuator and thus so as to control the axial position of the rotor relative to the stator.~~
11. (Currently Amended) ~~A~~The mechanism according to ~~C~~claim 8, comprising control means for controlling actuation of the actuator ~~and thusso as to control the axial position of the rotor relative to the stator.~~
12. (Currently Amended) ~~A~~The mechanism according to ~~C~~claim 7 ~~or Claim 11~~, wherein the control means comprises means for detecting the axial position of the rotor relative to the stator, ~~and means for controlling the means for actively controlling relative axial movement in response to the detected position.~~
13. (Currently Amended) ~~A~~The mechanism according to ~~any preceding claim 1~~, comprising means for limiting the amount of relative movement between the rotor and the stator.
14. (Currently Amended) ~~A~~The mechanism according to ~~any preceding claim 1~~, wherein at least one of the rotor and the stator comprises ~~is formed from, or~~

~~coated with, a wear-resistant material, to minimise damage in the event of contact between the rotor and the stator.~~

15. (Currently Amended) A The mechanism according to ~~any preceding claim 1,~~ wherein the rotor has at least two series of blades positioned in concentric annular arrays on a side of the rotor and wherein the stator has a corresponding number of channels within which the blades of the arrays can rotate, and further comprising means are provided to link the channels to form a continuous passageway connecting the channels through which fluid can pass.
16. (Currently Amended) A The mechanism according to ~~any preceding claim 1,~~ comprising a drive shaft for driving the mechanism.
17. (Currently Amended) A The mechanism according to ~~G~~claim 16, wherein the drive shaft is supported at each end thereof by a lubricant free bearing.
18. (Currently Amended) A The mechanism according to ~~G~~claim 17, wherein each lubricant free bearing comprises a magnetic bearing.
19. (Currently Amended) A The mechanism according to ~~any of G~~claims 16 ~~to 18,~~ wherein the drive shaft is additionally supported at each end by a rolling bearing.
20. (Currently Amended) A The mechanism according to ~~any of G~~claims 16 ~~to 19,~~ wherein the means for actively controlling relative axial movement is arranged to control axial movement of the drive shaft and thereby so as to control the axial position of the rotor relative to the stator.
21. (Currently Amended) A The mechanism according to ~~G~~claims 19 ~~and 20,~~ wherein the means for actively controlling relative axial movement is arranged to axially move a at least one of said rolling bearing so as to control the axial position of the drive shaft.

22. (Currently Amended) A pumping arrangement comprising a regenerative pumping mechanism comprising a rotor having a series of blades positioned in an annular array on one side of the rotor and extending axially into an annular channel of a stator within which the blades rotate, and means for actively controlling relative axial movement between the rotor and the stator so as to control the axial clearance between the rotor and the stator.~~according to any preceding claim.~~
23. (Canceled)
24. (Original) A pumping arrangement for controlling pressure in a chamber, the arrangement comprising a regenerative pumping mechanism comprising a rotor having a series of blades positioned in an annular array on one side of the rotor, and a stator having an annular channel within which the blades rotate; and means for effecting relative axial movement between the rotor and the stator during use of the pump to control the axial clearance between the rotor and the stator and so control the pressure in the chamber.
25. (Currently Amended) ~~A~~The pumping arrangement according to Claim 24, comprising a drive shaft for driving the mechanism, and wherein the means for actively controlling relative axial movement being is arranged to control axial movement of the drive shaft and thereby so as to control the axial position of the rotor relative to the stator.
26. (Currently Amended) ~~A~~The pumping arrangement according to Claim 24 or Claim 25, wherein the means for effecting relative axial movement comprises an axial magnetic bearing for controlling axial movement of the rotor relative to the stator.
27. (Currently Amended) ~~A~~The pumping arrangement according to Claim 24 or Claim 25, wherein the means for effecting relative axial movement comprises an actuator actuatable to control the axial position of the rotor relative to the stator.

28. (Currently Amended) ~~An~~ The pumping arrangement according to ~~G~~claims 25 and ~~27~~, wherein the actuator is arranged to move a bearing for supporting the drive shaft.
29. (New) The pumping arrangement according to claim 24 wherein the means for effecting relative axial movement comprises an axial magnetic bearing for controlling axial movement of the rotor relative to the stator.
30. (New) The pumping arrangement according to claim 24 wherein the means for effecting relative axial movement comprises an actuator actuatable to control the axial position of the rotor relative to the stator.
31. (New) The pumping arrangement according to claim 27 wherein the actuator is arranged to move a bearing for supporting the drive shaft.
32. (New) The mechanism according to claim 11 wherein the control means comprises means for detecting the axial position of the rotor relative to the stator.